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AUTHOR Meyen, Edward L.; And Others
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ABSTRACT

The paper details the assumptions about learning disabled (LD) adolescents and young adults as well as assumptions about conducting research with this population held by researchers at the Kansas Institute for Research in Learning Disabilities. Several factors and events which have directed the attention of educators and researchers to the needs of LD adolescents and young adults are pointed out, including passage of P.L. 94-142 (the Education for All Handicapped Children Act). The focus of the Institute is delineated in terms of research goals and objectives (such as to develop profiles of optimal settings for maximum performance). Research strategies for developing an epidemiology data base are outlined. Sections address target communities, marker variables, function of researchers, quality control procedures, and the data based management system. Described is implementation of Level I (designed to collect data) and Level II (designed to study selected constructs, theories, threats to validity, or identify and validate interrelationships among variables) research strategies. (Author/SB)

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INSTITUTE FOR RESEARCH IN LEARNING DISABILITIES
The University of Kansas
Lawrence, Kansas, 66045
Emphasis on Adolescents and Young Adults

ASSUMPTIONS AND STRATEGIES FOR CONDUCTING RESEARCH WITH LD ADOLESCENTS

Edward L. Meyen, Richard L. Schiefelbusch,
Donald D. Deshler, Gordon R. Alley,
Mary Ross Moran and Frances L. Clark

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The University of Kansas Institute for Research in Learning Disabilities is supported by a contract (#300-77-0494) with the Bureau of Education for the Handicapped, Department of Health, Education, and Welfare, U.S. Office of Education, through Title VI-G of Public Law 91-230. The University of Kansas Institute, a joint research effort involving the Department of Special Education and the Bureau of Child Research, has specified the learning disabled adolescent and young adult as the target population. The major responsibility of the Institute is to develop effective means of identifying learning disabled populations at the secondary level and to construct interventions that will have an effect upon school performance and life adjustment. Many areas of research have been designed to study the problems of LD adolescents and young adults in both school and non-school settings (e.g., employment, juvenile justice, military, etc.).

Co-Directors: Edward L. Meyen
Richard L. Schiefelbusch

Research Coordinator: Donald D. Deshler

Associate Coordinator: Jean B. Schumaker

Institute for Research in Learning Disabilities
The University of Kansas
313 Carruth-O'Leary Hall
Lawrence, KS 56045

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Cooperating Agencies

Were it not for the cooperation of many agencies in the public and private sector, the research efforts of The University of Kansas Institute for Research in Learning Disabilities could not be conducted. The Institute has maintained an on-going dialogue with participating school districts and agencies to give focus to the research questions and issues that we address as an Institute. We see this dialogue as a means of reducing the gap between research and practice. This communication also allows us to design procedures that: (a) protect the LD adolescent or young adult, (b) disrupt the on-going program as little as possible, and (c) provide appropriate research data.

The majority of our research to this time has been conducted in public school settings in both Kansas and Missouri. School districts in Kansas which are participating in various studies include: United School District (USD) 384, Blue Valley; USD 500, Kansas City; USD 469, Lansing; USD 497, Lawrence; USD 453, Leavenworth; USD 233, Olathe; USD 305, Salina; USD 450, Shawnee Heights; USD 512, Shawnee Mission, USD 464, Tonganoxie; USD 202, Turner; and USD 501, Topeka. Studies are also being conducted in Center School District and the New School for Human Education, Kansas City, Missouri; the School District of St. Joseph, St. Joseph, Missouri; Delta County, Colorado School District; Montrose County, Colorado School District; Elkhart Community Schools, Elkhart, Indiana; and Beaverton School District, Beaverton, Oregon. Many Child Service Demonstration Centers throughout the country have also contributed to our efforts.

Agencies currently participating in research in the juvenile justice system are the Overland Park, Kansas Youth Diversion Project and the Douglas, Johnson, and Leavenworth County, Kansas Juvenile Courts. Other agencies have participated in out-of-school studies--Achievement Place and Penn House of Lawrence, Kansas, Kansas State Industrial Reformatory, Hutchinson, Kansas; the U.S. Military; and the Job Corps. Numerous employers in the public and private sector have also aided us with studies in employment.

While the agencies mentioned above allowed us to contact individuals and supported our efforts, the cooperation of those individuals--LD adolescents and young adults; parents; professionals in education, the criminal justice system, the business community, and the military--have provided the valuable data for our research. This information will assist us in our research endeavors that have the potential of yielding greatest payoff for interventions with the LD adolescent and young adult.

Abstract

The University of Kansas Institute for Research in Learning Disabilities is committed to the development of a comprehensive epidemiology data base as a strategy for describing learning disabilities as a behavioral set among adolescents and young adults and as a basis for the design and validation of interventions to enhance performance in school and non-school settings. This paper details the assumptions about learning disabled adolescents and young adults as well as assumptions about conducting research with this population held by researchers at the Kansas Institute. Strategies developed to facilitate the development and implementation of programmatic, institutional research are presented. The relationship among the research assumptions, goals and objectives, and strategies is an interactive process with each contributing to the development of and also evolving from the others.

ASSUMPTIONS AND STRATEGIES FOR CONDUCTING RESEARCH WITH LEARNING DISABLED ADOLESCENTS AND YOUNG ADULTS

During the past ten years, programs for children identified as learning disabled (LD) have evolved as major educational options at the elementary school level. The rate of growth in such programs has far exceeded similar special education alternatives for learning disabled adolescents and young adults in junior and senior high schools and in out-of-school settings. From the start, however, some parents and professionals have tried to combat this neglect of the older student. Although they contributed to organizational efforts to make government officials, public school administrators, and teachers aware of the unique instructional requirements of individuals with specific learning disabilities, often they were forced to watch with resignation as programs were initiated only at the elementary level. Time was on their side, however. Children in elementary schools eventually became adolescents. With each passing year, the ranks of those interested in adolescents with specific learning disabilities have become larger and increasingly more vocal. Only now, a decade and a half after the founding of the LD movement, are the problems of adolescents and young adults with specific learning disabilities beginning to receive a fair portion of attention.

As the learning disability field has evolved, several factors and events have occurred to direct the attention of educators and researchers to the unique needs of the LD adolescent and young adult.

1. The Education for All Handicapped Children Act of 1975, P.L. 94-142, specified that states and their school districts must guarantee a free appropriate public education to all handicapped individuals between the ages of 3 and 21. Thus, the educational concerns of the learning disabled adolescent and young adult are guaranteed under the law.

2. An underlying assumption that dominated the learning disability field during its formative years has been that the learning disability child could be "cured." However, as children, identified as learning disabled in elementary grades, progressed through the programs provided them, it has become apparent that the impact of their learning disabilities was not substantially altered and that they entered secondary schools still hampered by their disability. This observation suggests that the condition of learning disability is highly resistant to remediation or that the interventions employed lack the power required to eliminate the condition or to minimize its consequences.

3. The relationships of reading problems and other specific disabilities to dropping out of school, contact with the courts, and problems of underemployment have become a topic of much interest. The current practice of defining the LD adolescent primarily in terms of the impact of his specific disability upon academic functioning and educational opportunities does not accurately indicate the varied nature and ways in which the handicap can be manifested in older ages. Case studies and anecdotal records suggest that learning disability obtains at maturity and prevails as a major inhibitor of developing human resources.

4. The demands of the secondary curriculum are much different from demands placed on students in elementary grades. It is assumed that by the time students have reached the secondary schools, they have mastered the basic skills emphasizedat the elementary level in reading, writing, spelling, mathematics, and spoken language to allow them to use these skills as "tools" in acquiring information from the curriculum. Unfortunately, many LD adolescents have not mastered these skills at a level to allow them to compete successfully with their peers. Not only do the secondary curricula presuppose the basic skills of decoding and computation taught in the elementary school, they also require a much broader array of skills in such areas as listening, problem solving, decision making, and personal-social adjustments. As educators have come to a realization of the types of demands placed on the LD adolescent, they have acknowledged the need for intervention strategies different from those typically used with the LD student in the elementary setting.

5. Increasing evidence suggests that adolescents and young adults with learning disabilities experience significant problems in social adjustment, social perception, self-concept, and motivation. Educators have stressed that those accompanying difficulties warrant the full attention of those involved in the educational process of learning disabled adolescents because of the potentially heavy toll a history of prolonged failure can take on the LD adolescent. Such problems are potentially a greater hindrance to success and adjustment in life than is the mastery of certain academic concepts.

Basic to addressing these unique needs of the LD adolescent and young adult is the resolution of three key factors in the

in the learning disability field, i.e., (a) the definition of the learning disabled individual, (b) the specification of criteria and procedures to identify the learner, and (c) the validation of interventions. But in the field of learning disabilities there is little agreement on the definition, the criteria and procedures to identify learning disabled persons, or the efficacy of the available interventions.

Educators and researchers working with LD adolescents and young adults do not openly disagree with the general definition of learning disabilities as it is stated in PL 94-142. However, as it stands, the definition is so inclusive that it can tolerate most criteria and procedures for identification and various interventions.

Most disagreements among investigators in secondary learning disabilities focused on specific criteria and procedures for identifying learning disabled adolescents and ensuing intervention(s) deemed necessary to enhance the LD adolescent's functioning. For example, some investigators have included explicit medical criteria as part of the identification characteristics of learning disability. These procedures may call for neurological and/or sensory examinations. Other investigators have included only academically oriented achievement and aptitude indicators. Similar confusion persists relative to the procedures or measures used in assessing the criteria for learning disabilities among educators and researchers in the field.

Furthermore, when studying the interventions used to enhance the adjustment of the learning disabled adolescent the same state of affairs exists. One group of investigators suggests a learning

strategies and study skills intervention model, while another group advocates teaching the basic skills of reading, writing, and mathematics. A third source simply provides intervention ideas with no rationale. Finally, some teachers attempt to tutor in the content areas, teach vocational skills or provide a potpourri in hope that something would work.

The situation is even more nebulous when considering the learning disabled young adult. Operating on the premise that learning disabilities historically has been a significant contributor to the subpopulation of problem learners, it can be assumed that a subpopulation of adults also exists whose life styles have been substantially altered by the presence of learning disabilities. An examination of data on individuals who are unemployed, underemployed, adjudicated, and dependent confirms the impact of characteristics such as those ascribed to learning disabilities. However, in contrast to the public schools, there has been no comparable investment in the design of interventions or compensatory provisions to enhance the performance of learning disabled adolescents or adults. As adults, they appear to be neither identified nor treated as learning disabled. Their needs have been ignored and the consequences of their disabilities allowed to manifest themselves as social and economic disadvantages. Only recently has the personal and societal loss experienced as a result of not responding to the needs of this group been recognized.

Because the learning disabled adult is more likely to be underemployed rather than unemployed and socially competent rather than incompetent, their identify frequently is shielded by their membership in larger subpopulations of individuals experiencing similar problems

for other reasons. This situation coupled with the relatively short history of school interventions for this population has complicated the process of researching the status of learning disabled adults. There is such a paucity of investigations and theoretical or philosophical positions that few statements can be provided to give direction to research investigators. In light of the lack of knowledge and direction related to identifying and intervening with LD adolescents and young adults, it is not only timely, but essential, that a major investment be made in researching the impact of learning disabiities on this particular population. Accordingly, emphasis in The University of Kansas Institute for Research in Learning Disabilities is directed to research on models and procedures for the identification of cognitive and behavioral characteristics of adolescents and young adults with specific learning disabilities and the development of interventions applicable to actualizing their capabilities in school and nonschool settings.

Research Focus

The following facets of the research mission collectively represent the focus of The University of Kansas Institute.

1. The target population is comprised of adolescents and young adults meeting the PL 94-142 definition of learning disabilities or who in their educational histories were identified and treated as learning disabled according to the criteria employed by the schools they attended. The target population is to be distinguished from the broader population of adolescents who demonstrate learning problems of a generalized nature due to a variety of factors, such as other handicapping conditions, lack of motivation, or factors within the environment, i.e., economic deprivation or cultural diversity.

Distinguishing the target population from populations whose underachievement can be ascribed to cultural difference or economic disadvantage does not rule out the possible coexistence of a learning disability and membership in a minority culture. Nor does the focus on underachievement preclude the possibility that some learning disabled adolescents may be high achievers in some academic or nonacademic pursuits.

2. A comprehensive epidemiology data base derived from studies of the school, home, community, and employment environments is being systematically developed as a prerequistive for the development, validation, and generalization of interventions.

3. Considerable attention is given to interventions designed to correct, prevent, and/or remediate the impact of learning disabilities. However, emphasis is also directed to identifying existing support systems in school and non-school settings which can be used in an enhancing or compensatory way by learning disabled individuals. This approach to intervention is based on the logic that in the non-school setting particularly, and to a significant degree in school settings, the learning disabled person must depend on the support systems that exist and cannot anticipate the availability of new and/or different support systems. However, the benefits of such support systems can be made more applicable to the needs of the learning disabled and they, in turn, can be taught to use them more effectively.

Research Goals and Objectives

The following statements, while not detailed in terms of specific research questions, represent the major research priorities of

The University of Kansas Institute.

Goal 1. To substantiate the impact of childhood learning disabilities on adolescent and adult adjustment

Objective a. To establish a data base which illustrates the circumstances encountered by learning disabled adolescents and young adults in employment settings, social situations, and interpersonal interactions

Objective b. To identify the relationships between specific characteristics of learning disabled adolescents and life adjustments problems such as unemployment, underemployment, social maladjustment, and underachievement in post-secondary educational programs

Goal 2. To develop validated criteria which identify learning disabled adolescents and young adults in school and non-school settings

Objective a. To design profiles of learning disabled adolescents and young adults based on follow-up studies of individuals identified and treated as learning disabled during their school age years

Objective b. To design and validate efficient identification strategies applicable to adolescents which take into consideration the individuals' primary and elementary educational histories in addition to those curriculum and instructional demands which occur in secondary schools

Objective c. To determine marker variables which predict the probabilities of an individual being learning disabled as an adult

Goal 3. To develop and validate intervention models applicable to school and non-school settings which are sufficiently powerful to lessen, compensate for, or remediate the impact of learning disabilities on the life performance of learning disabled individuals.

Objective a. To identify successful interventions applicable to school and/or non-school settings

Objective b. To determine those features of successful interventions which are generalizable and therefore important to the design of new interventions

Objective c. To validate the effectiveness of interventions incorporating identified successful features

Goal 4. To explore the merits of building on existing support in school and non-school settings in meeting the needs of adolescents and young adults

Objective a. To identify those support systems which are basic to public school programs, community agencies, families and employment

Objective b. To develop strategies for making such support systems more accessible to and effective for learning disabled adolescents and young adults

Goal 5. To develop profiles of optimal school and non-school settings for the maximum performance of learning disabled adolescents and young adults

Objective a. To identify those features of school and non-school settings which differentiate between positive and negative influences on learning disabled adolescents

Objective b. To establish a data base for designing optimal arrangements for generalizing positive setting features

Research Assumptions

A number of beliefs are held by member researchers. These beliefs derive from their experiences in research, teaching, and teacher education related to learning disabilities. They are presented as assumptions in two sets, i.e., assumptions related to the nature of learning disabilities and assumptions related to researching learning disabilities.

Assumptions Related to the Nature of Learning Disabilities

1. Learning disabilities represent a condition which tends to become obvious when the individual encounters the demands of academic learning as a child and persists through adulthood.
2. There are certain cognitive characteristics which are unique to learning disabled adolescents.
3. The behavior of leaning disabled adolescents is a function of the interaction between learner attributes and environmental conditions.
4. The nature of learning disabilities is highly resistant to traditional intervention procedures.

Assumptions Related to Researching Learning Disabilities Among Adolescents

1. Comprehensive epidemiology studies are essential as a data base for making decisions on needed interventions.
2. The impact of learning disabilities among adolescents and young adults is not limited to school related learning but

impacts on all dimensions of the individual's life including employment, family relations, and general social interactions.

3. Techniques found to be successful in compensating for or remediating learning disabilities in one setting, e.g., school or employment, are generalizable to other settings.
4. An interdisciplinary approach is imperative to effectively research the impact of learning disabilities among adolescents and subsequently design and validate appropriate interventions.
5. Although there is an emerging body of literature related to learning disabilities, research in this area is currently underdeveloped.
6. The paucity of research specific to learning disabled adolescents and young adults who have succeeded is a major void in the research literature.

Research Strategies

The development of programmatic research to investigate learning disabilities among adolescents and young adults necessitated the design of highly interrelated research strategies. While each of these strategies presented below are highly related, they are discussed separately for purposes of definition and clarification.

Epidemiology Base

The most pressing needs in the learning disability field relate to the development of validated identification procedures and intervention models for LD adolescents and young adults. A preliminary, yet very major step to meeting these needs is to establish an epidemiology base upon which research and service delivery decisions can be made. Cruickshank (1977) has pointed out that the field of

learning disabilities "possesses an inadequate research base.... and there is absolutely no adequate data of either an epidemiological or demographic nature to provide a base for adequate programming" (p. 55).

The state of the art pertaining to learning disabilities among adolescents and young adults is such that to initiate programmatic research without the benefit of an epidemiology data base would be to risk perpetuating unfounded assumptions. The Institute concept promulgated by the Bureau of Education for the Handicapped provides a type of structure and resources necessary to establish such a base. Thus, The University of Kansas Research Institute has been designed as an epidemiologically-based institute. The Institute's first programmatic research year emphasized the systematic collection of a broad array of data to form an epidemiological base.

The epidemiology base is serving two functions. The major function is in providing direction for the formulation of intervention and generalization research studies. Basically, these studies are designed to study selected constructs, theories, or validation probes using experimental or quasi-experimental research designs. A secondary, but very important, function is the creation of a descriptive baseline data reference. To collect these data, large scale collection studies have been, and continue to be, conducted primarily in a few target communities. Basically, these studies are designed to create a descriptive data base on factors that contribute to the prevalence of learning disabilities among adolescents and young adults.

The development of the comprehensive epidemiology data base involves the systematic collection of descriptive data across situational settings that are central to the current status and future of learning disabled adolescents and young adults, i.e., public schools, alternative educational arrangements, employment settings, and community settings.

1. School Settings: Traditional academic settings, such as junior high school, senior high school, community college, four-year college, area vocational school, and technical school
2. Alternative Educational Settings: Nontraditional academic settings, such as alternative high schools or alternative family structures that are directly related to the provision of education, e.g., group homes, foster homes, or institutions
3. Employment Market Settings: Those settings that provide employment opportunities, such as business, vocational, or military
4. Community Settings: Community resources including the family, recreation resources, and agencies which provide services intended for all citizens

The parameters for data collection within each setting will include four areas of investigation:

1. Learner Characteristics: Attribute data on the characteristics of learning disabled adolescents

2. Intervention Applied: Those interventions, i.e., procedures, materials, scheduling arrangements, resources, etc., employed with the intent of enhancing the performance of the LD adolescent
3. Support Systems Available: These services and resources routinely made available to the population served by the setting
4. Conditions: Those factors external to the learner which serve to precipitate, reduce, or accentuate a learning disability

Target Communities

Epidemiology research necessitates access to large numbers of subjects and to the natural settings in which they reside. The data collected may not require the manipulation of variables or the structure of experimental designs but such research does make extensive demands on the sites where data are collected. School districts and community agencies have rightfully become protective of their domains in terms of allowing research to occur within their jurisdictions. This response in some cases is to protect the welfare of subjects. In other cases it is to minimize the interruptions in services caused by research. A third reason is inappropriate planning by researchers in collecting data from applied settings. The Institute researchers are highly sensitive to each circumstance. On the other hand, to accomplish the research mission of the Institute access to subjects and settings is essential. Rather than dispersing data collection efforts across a wide array of school districts and communities the concept of target communities was agreed to as an alternative.

By selecting target communities, epidemiology data collection has been consolidated to the degree possible in target communities. This includes data collection in school and non-school settings. The advantages are clear, i.e., assurance of subjects, fewer sites to maintain, relative ease of developing personal contacts and understanding district and agency policies, and reductions in costs. The disadvantages are minimal when considered in the context of gaining access to subjects and sites. The primary disadvantage relates to the representativeness of subjects. This has been resolved to an extent by the criteria employed in the selection of target communities and the large number of subjects available through the target communities.

The following criteria were employed in the selection of target communities.

1. Accessibility of community to the Institute: Factors such as distance, highways, time, and known contacts in schools and communities were included.
2. History of community response to needs of special groups: It was considered important to select communities which had demonstrated an interest in the needs of special groups.
3. Status and history of school programs: Public school programs offering educational services for the learning disabled from elementary through secondary grades with at least a five-year history of providing special education services to the learning disabled were sought. A secondary, but important, school-related criterion was that the diagnostic staff responsible for placing students in programs for the learning disabled be fully certified by the state.

4. Active parental involvement: It was considered important that there be evidence of active concern on the part of parents of learning disabled children and youth. A formal organization was not the criterion.

Marker Variables

Institute researchers have adopted "marker variables" as a means of guiding and comparing research within the Institute. The work of Keogh (1976), White and Duker (1973), and Bell and Hertz (1976), which underscored the importance of educational and psychological research being conducted in such a way that results can be compared, generalized, and evaluated, has been considered in conceptualizing the approach to marker variables. Marker variables can be defined as a set of variables which are collected in common by those conducting research within a given field. They reflect the constructs which characterize a given field and may tap cognitive, motivational, behavioral, medical or experiential dimensions. Markers are not limited merely to demographic variables.

The comprehensive epidemiology study represents an attempt to determine what variables collected in the target communities might be considered markers. Marker variables identified in this study are being cross-validated and will be used in subsequent research efforts to facilitate the comparability and generalizability of research conducted within the Institute.

According to Bell and Hertz (1976) the learning disability field is in an ideal position to apply the marker variable concept to its research. They have stated:

> "The ideal time is when there has been a quickening of interest in the field, indicating that a large number of studies will soon be carried out, and yet sufficient work has already been done so as to make it possible to establish the needed empirical anchors. Marker variables are not useful in studies at the "cutting edge" of science in which there are few investigators involved, each with a unique approach, and no clear indication of which way the field will move. Whether or not an upsurge of interest is likely to emerge, the marker-variable approach may be useful if there have been many studies carried out in the past and an indication that they will continue in the future, even though results have not been sufficiently clear to make possible any summary findings for the area. Marker variables are also of value to investigators who are unsure of what to include in the way of background variables. The existence of well recognized marker measures that can be readily incorporated in a study design may prevent not only underinclusion but also the inclusion of too many variables, in cases where the investigator might otherwise cast too wide a net (p. 10)."

While the application of the marker variable concept to learning disabilities research is relatively new, it appears to hold promise for institute-type research. Thus, a major research strategy of The University of Kansas Institute has been to identify and validate marker variables for LD adolescents and young adults.

Function of Researchers

A major concern of the Institute has been to create a climate in which member researchers have conceptualized research within an institute rather than an individual framework. Since the strength of any research institute is a function of the strength of individual participants, a primary focus of this Institute has been to cast the research expertise of member researchers into the context of the Institute goals.

Participating researchers believe that institute research is more than an organizational structure and that the mission of an institute is not served if each participating researcher operates as an

independent investigator. On the other hand, researchers must be provided a certain amount of independent control of resources if they are to maintain the quality control they apply to their personal research and generalize to involvement in the Institute. Therefore, the development of a management style which provides sufficient investigator independence but which ensures the centralization requirements of the Institute has been a major priority.

An example of this management philosophy can be readily seen in the design, data collection and data analysis of the comprehensive epidemiology study. This study represents how the independence of investigators can be incorporated into research as well as centralizing some research functions. Specifically, member researchers were asked to identify key variables or data to be collected in the target communities. In some cases these variables were ones that held particular significance to an investigator(s) while in other cases the variables identified had broader applicability across studies within the Institute. However, the Research Management Team made every effort to incorporate the data needs of member researchers into the comprehensive epidemiology study.

Quality Control Procedures

A major concern of the Institute staff is to carry out research that is well controlled and consistent with the goals of the Institute. Accordingly, some procedures and guidelines have been developed and agreed upon by Institute researchers to monitor proposal development as well as research conducted in the field.

One procedure employed to monitor the types of subjects used in research studies is the subject validation team. The purpose

of this team is to assure that the subjects used by researchers are considered to be learning disabled by the members of the subject validation team. The team is composed of individuals who are certified in the following areas: secondary learning disabilities, school psychology, social work, speech therapy and remedial reading. Each researcher submits as much data as can be obtained on each subject to the validation team. Each member of the team reviews the data on the subject and determines the probability of the subject being learning disabled. Researchers are encouraged to focus their research efforts on students identified by the above procedure. If additional students are used, the researcher must carefully document why subjects other than those validated by the Subject Validation Team have been included in the design.

Another procedure for controlling the quality of research conducted is to have all researchers follow common guidelines relative to: (a) criteria for acceptable research, (b) evaluating interventions, and (c) evaluating assessment instruments. These guidelines have been deliberately written to be somewhat broad so as to accommodate unique research approaches and methodologies. Nevertheless, application of these guidelines in the proposal development process has demonstrated their usefulness in directing researcher's attention to critical factors in designing and conducting research.

Data-Based Management System

Studies conducted within the Institute have resulted in a large quantity of data that have the potential of benefiting the field of learning disabilities. Taken alone, individual studies provide a useful base of information from which future research can grow.

However, because of the Institute framework surrounding these studies, the data can serve other purposes as well. By integrating the data collection and storage systems, each study contributes to a centralized data pool. Information then can be related to a variety of other measures beyond those that were the major concern of the study. Another benefit is that integration of research allows researchers to unify their efforts to provide for maximum generality of results. That is, where researchers are examining similar phenomena, communication prior to research implementation can allow for the same conventions for data collection; thus their research can be comparable when desired. Where a researcher can add a variable (of interest to another investigator) to a data collection system, information then can be related to a variety of other measures beyond those that were the major concern of the study. Another benefit is that integration of research allows researchers to unify their efforts to provide for maximum generality of results. That is, where researchers are examining similar phenomena, communication prior to research implementation can allow for the same conventions for data collection; thus their research can be comparable when desired. Where a researcher can add a variable (of interest to another investigator) to a data collection system, information can be provided to the investigator primarily interested in that variable, resulting in an increase in the sample size for that researcher's project.

Information gathered on the subjects within the target communities by individuals or projects affiliated with the Institute can be combined and related to variables studied by other investigators. The Institute data also can be shared with the other LD Institutes

and other agencies with similar interests to maximize the benefits of their results. One final, but important, reason for the integration of research is that it permits the generation of information not otherwise available. A variety of measures taken across a group of children by different investigators can be examined for relationships that may exist among those variables. Evidence of correlations may point the way to more extensive analysis of those relationships either through more descriptive studies or through manipulative experiments. In these ways, the amount of information obtained from the Institute will be greater than that derived from the collection of unintegrated research studies. Thus, it is a goal of the Institute to integrate research in such a way as to utilize all data to its greatest potential while at the same time ensuring the autonomy of the investigators.

Institute investigators have worked together to establish a plan which ensures that an integration of research will occur both within and across the major research missions of the Institute (epidemiology, intervention, and generalization) as well as within and across major research settings (schools, alternative education, and employment). Obviously, this effort to integrate research requires a major commitment from Institute investigators as well as considerable resources. Member investigators and Institute staff have implemented the following means of ensuring that integrative objectives are met:

1. Coordination of research projects. The Institute staff is responsible for monitoring studies, suggesting interfaces between and among studies, and facilitating communication about those

interfaces among researchers. Communication about research efforts is facilitated through two main activities: progress reports and research meetings.

2. Coordination of data collection. All researchers working with subjects not included in the comprehensive epidemiology study collect collect as much learner characteristics data, i.e., marker variables, on their subjects as possible. Institute staff ensures that investigators are provided with the materials (e.g., questionnaires) and training on how to use the materials or personnel with experience in using the materials so that this data collection can take place in a coordinated way. In addition, Institute staff works with other researchers in the field of learning disabilities to determine variables which can be measured by all researchers and ways in which those and other data can be shared.

3. Coordination of the computer resources of the Institute. Institute staff serves as liaison between investigators and computer staff. In addition, they ensure that investigators understand the resources available to them, such that resources are used maximally. Institute research staff is available for consultation with the investigators. Finally, Institute staff works with computer staff to either adapt software packages to institute needs or to prepare such packages for the Institute.

4. Selection and adaptation of a Data Base Management System. Martin (1975) has defined a data base as:

> ....a collection of interrelated data stored together with as little redundancy as possible to serve one or more applications in an optimal fashion; the data stores so that they are independent of programs which use the data. A common controlled approach is used in adding new data, and in modifying and retrieving existing data within the data base (p. 19).

Since studies within the Institute generate a large data base, it has been deemed necessary to have a management system which allows for optimal use of the data base by all of the Institute's participating investigators. The system is designed such that data can be added to the data base at any time and not affect the programs that manipulate those data. In addition, new programs can be added, old programs can be modified, and different manipulations can be applied to subsets of data without affecting those data.

5. Designing integrative studies. Institute staff actively pursues the goal of designing and implementing integrative studies. That is, if the data from two or more studies are related (e.g., different data are collected on the same subjects by two investigators), these relations are explored with the investigators involved, possible studies are designed, and assistance provided in determing the possible relationships involved.

Implementation of Research Strategies

The research and development plan of the Institute has followed a sequence of steps going from an emphasis on epidemiological research during the first year of programmatic research to an emphasis on intervention and generalization research. While each year of research within the Institute has or will take on a new focus, it is important to note that each year will involve some research activity related to epidemiology, interventions, and generalization.

There were two research thrusts during the first programmatic research year. The first was the Level I research designed to collect data for the purpose of establishing an epidemiology base. The intent of this research was to increase our knowledge base of a learning disabled youth and the existing practices and conditions

surrounding that youth. The second thrust was a series of studies (Level II) representing a broad range of interests of member researchers. A few of these studies looked at interventions in isolation so as to determine their impact in a given setting and to define the parameters of a given intervention as a function of a setting. Using data provided by the epidemiology base and the Level II studies, intervention and generalization studies are being conducted for the purpose of enhancing the learning and adjustment of LD adolescents.

Level I Study

Level I research is designed to collect data which is descriptive in nature, i.e., what exists. Such studies systematically collect data on predetermined variables. The variables to be studied were generated from a review of the literature and from member researchers in the Institute representing the areas of education, psychology, human development, sociology, medicine, and curriculum and instruction to provide a multidisciplinary view of the possible multiple causation of learning disabilities. Data has been, and continues to be, collected within three major areas: learner characteristics, interventions applied, and/or available conditions surrounding LD adolescents.

Descriptive data on learner characteristics was collected on adolescents labeled learning disabled by the schools. Similar data is being collected in employment settings and other non-school settings on individuals who acquired the label of learning disabilities while in elementary or secondary school.

Descriptive data was also collected on interventions currently in popular use with LD adolescents. Examples of interventions

being studied include instructional arrangements and materials as well as strategies used by employers in training LD adolescents for job roles.

Descriptive data on existing conditions in the family, school, and community that may influence the prevalence of learning disabilities among adolescents and that influence the performance of adolescents with learning disabilities was also collected. Examples of such data are pupil-teacher ratio; scheduling patterns; availability of materials; attitudes of teachers, parents, and employers; understanding of peers; grading practices; support by family; etc.

Information on support systems and resources currently available to the LD adolescent was also collected. Examples include support services in schools ranging from counseling services to the availability of volunteer tutors or extra-curricular activities.

The Institute is pursuing epidemiology based questions by conducting epidemiology investigations in three major settings, i.e., school, employment, and juvenile justice. This work is continuing because of the limited data base that exists for learning disabled adolescents and young adults. The epidemiology work consists of: (a) cross-validation of the Level I study conducted the first year, (b) collection of longitudinal data on selected students from the Level I study, and (c) specific investigations by member researchers designed to study specific learner characteristics, setting variables, etc., in depth.

Level II Studies

The data base provided by the Level I comprehensive epidemiology study is not sufficient, in and of itself, to focus the direction of research and to formulate identification criteria and interventions.

This data base established in the Level I study provided lists of markers and profiles of variables. In contrast, Level II studies relate to the development of specific interventions. The data from Level II studies form solid bases from which particular interventions are developed.

Level II studies are designed to collect data that is complementary to the Level I study. Level II investigations study selected constructs, theories, threats to validity, or identify and validate interrelationships among variables using correlational, experimental and quasi-experimental designs.

Level II studies relate to the five research goals of the Institute. However, the Level II studies do not solely provide the most efficient or practical vehicle toward meeting the objectives among the goals. Rather, the objectives of each of the five goals dictates the appropriate use of Level I and Level II studies. For example, Goal 1 is to substantiate the impact of childhood learning disabilities on later adult adjustment. This goal includes an objective which requires a descriptive follow-up case study of children labeled as learning disabled students. The forces and elements of these forces that contribute to the individuality of this group of learning disabled adolescents and young adults are to be identified as factors, descriptor variables, and markers by the Level I Comprehensive Study. The investigation of the validity of these factors, descriptor variables, and markers are to be conducted as Level II studies. The example provides research implications for any of the objectives among the five research goals.

Summary

The University of Kansas Institute for Research in Learning Disabilities is committed to the development of a comprehensive epidemiology data base as a strategy for describing learning disabilities as a behavioral set among adolescents and young adults and as a basis for the design and validation of interventions to enhance performance in school and non-school settings. The anticipated outcomes include an improved technology for the design of interventions which enhance the learning disabled adolescent's successful use of support systems in the school, home, community, and employment settings. The achievement of these outcomes is dependent not only on an understanding of the LD adolescent and young adult but also on an understanding of research in the area of learning disabilities. This paper has described strategies developed by Institute researchers that will allow careful delineation of research questions and attention to the impact of learning disabilities in adolescence and adulthood. It is essential that the prevailing conditions which surround the presence of learning disabilities as an inhibitor of human potential be investigated and interventions developed to lessen its effect on school performance and life adjustment.

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